

82349

## Work Order ID 85387

\*85387\*

Page 1

June-07-12 9:25:42 AM

Item ID: D412-664-203TRN

Accept

\*N900040100\*

Setup Start \*NS1\*

Revision ID:

Stop \*NS2\*

Item Name: Crosstube Turning Detail

Start Date: 07/06/2012 Start Qty: 1.00

\*1\*

Cust Item ID:

Required Date: 21/06/2012 Req'd Qty: 1.00

\*1\*

Customer:

Reference:

Approvals: Process Plan: MLJ

Date: 12/06/07 Tooling:

Run Start \*NR1\*

QC:

Date: SPC (Y/N):

Date:

Stop \*NR2\*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D412-664-243	Rev E(DEO)								
100		0.00							
*100*	MORI SEIKI CNC LATHE LARGE								
Mori Seiki	Memo	0.00							
Mori Seiki CNC Lathe Large	1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA166 2-Turn first side as per Folio FA166 3- File transition lines smooth. FOLIO REV: <u>AA</u> DWG REV: <u>E</u>								
110		0.00							
*110*	QC1- Inspect dimensions to dimension sheet								
QC	Memo	0.00							
Quality Control									

1 Ø

AMM-L  
12/06/16

1 Ø

AMM-L  
12/06/16

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

# Work Order ID 85387

**\*85387\***

Page 2

June-07-12 9:25:42 AM

Item ID: D412-664-203TRN

Accept

**\*N900040100\***

Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: Crosstube Turning Detail

Start Date: 07/06/2012 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 21/06/2012 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start **\*NR1\***

QC:

Date:

SPC (Y/N):

Date:

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120		0.00							
<b>*120*</b>	MORI SEIKI CNC LATHE LARGE								
Mori Seiki	<b>Memo</b>	0.00							
Mori Seiki CNC Lathe Large	1-Turn second side as per Folio FA166 2- File transition lines smooth. 3- Remove sand and plugs 4-Scribe part # and batch # using vibrating stilus FOLIO REV: <u>    </u> DWG REV: <u>    </u>								
130		0.00							
<b>*130*</b>	QC1- Inspect dimensions to dimension sheet								
QC	<b>Memo</b>	0.00							
Quality Control									
140		0.00							
<b>*140*</b>	QC8- Inspect parts - second check								
QC	<b>Memo</b>	0.00							
Quality Control									

1 0

mm L  
12/06/12

1 0

mm L  
12/06/12

DP 12-6-18

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

NCR: Yes / No

## WORK ORDER NON-CONFORMANCE / UPDATE

DQA: DAH Date: 12/06/28QA Closed: CL Date: 12/6/29

Work Order: <u>85387</u>	<b>DISPOSITION</b> Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input checked="" type="checkbox"/> Work Order Update <input type="checkbox"/>	<b>AGAINST DEPARTMENT/PROCESS</b>			
Part No. <u>D412-664-203TRN</u>		Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/>	Crosstube <input checked="" type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/> Other <input type="checkbox"/>	Engineering Quality <input type="checkbox"/>
NCR No. <u>12-1544</u>					

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data <input checked="" type="checkbox"/>	12/06/22	130	1	PART WAS INSPECTED PER QSI-038 BUT WAS UNABLE TO RECORD DIMENSION REQUIRED ON INSPECTION SHEET FOR READING 4 ON FAI INSPECTION SHEET. POSSIBLE DIMENSIONS ARE PART OF RECEIVING REPORT	GP 12/6/27 OSLOH	Acceptable. READING 4 IS ON RAW MATIL & RAW MATIL IS GOOD	GP 12/6/27	DP 12-6-27	S 12/06/27
Equip/Tooling <input type="checkbox"/>									
Operator <input type="checkbox"/>									
Material <input type="checkbox"/>									
Offset/Setup <input type="checkbox"/>									
Other <input type="checkbox"/>									
Process <input type="checkbox"/>									
Supplier <input type="checkbox"/>									
Training <input checked="" type="checkbox"/>									
Unauthorized <input type="checkbox"/>									

## FAULT CATEGORY

## Landing Gear

- ☐ Bending Passes Below Min
- ☐ Centre Not Concentric to O/S
- ☐ Cracks
- ☐ Crushed/Crimp at Bending
- ☐ Inspection Strip in Tube
- ☐ Other
- ☐ Positioned Wrong
- ☐ Ripples on Inner Bend
- ☐ Torque Waves in Extrusion
- ☐ Turning Sequence
- ☐ Wave/Twist in Tube

## Hardware

- ☐ Breaking
- ☐ Missing
- ☐ Size/Length
- ☐ Spinning
- ☐ Threading
- ☐ Wrong

## Drill Holes

- ☐ Misaligned
- ☐ Ovalized
- ☐ Over/Undersized
- ☐ Too Many

## General

- ☐ Burrs
- ☐ Contamination
- ☐ Cut Too Short
- ☐ Documentation/Data
- ☐ Finish
- ☒ Inspection Incomplete
- ☐ Inspection Unqualified
- ☐ Instructions Incomplete/Unclear
- ☐ Jigs/Fixtures/Tooling
- ☐ Kit Incorrect
- ☐ Kit Missing

- ☐ Maintenance
- ☐ Mislabeled
- ☐ Off-Set
- ☐ Orientation Misread
- ☐ Out of Calibration
- ☐ Out of Sequence
- ☐ Outside Dimensions
- ☐ Over/Under tolerance
- ☐ Part Lost
- ☐ Part Moved
- ☐ Raw Material

- ☐ Set-up
- ☐ Supplier
- ☐ Temperature/Cure
- ☐ Weld
- ☐ Wrong Stock Pulled
- ☐ Other

# Work Order ID 85387

June-07-12 9:25:42 AM

**\*85387\***

Page 3

Item ID: D412-664-203TRN

Accept

**\*N900040100\***

Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: Crosstube Turning Detail

Start Date: 07/06/2012 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 21/06/2012 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start **\*NR1\***

QC:

Date:

SPC (Y/N):

Date:

Stop **\*NR2\***

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

145

0.00

**\*145\***

Crosstubes

Crosstubes

Memo

0.00

GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.

etch inside of tube only →

TW

12-6-20

150

Crosstubes Chemical Conversion

0.00

**\*150\***

HandFXtube

Hand Finishing Crosstubes

Memo

0.00

n/so

160

QC7-Inspect Chemical Conversion Coat

0.00

**\*160\***

QC

Quality Control

Memo

0.00

n/so

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

# Work Order ID 85387

**\*85387\***

Page 4

June-07-12 9:25:42 AM

Item ID: D412-664-203TRN

Accept

**\*N900040100\***

Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: Crosstube Turning Detail

Start Date: 07/06/2012 Start Qty: 1.00 **\*1\***

Cust Item ID:

Required Date: 21/06/2012 Req'd Qty: 1.00 **\*1\***

Customer:

Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run Start <b>*NR1*</b>
	QC:	Date:	SPC (Y/N):	Date:	Stop <b>*NR2*</b>

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
170		0.00							
<b>*170*</b>	Packaging								
Packaging	Memo	0.00							
Packaging	Identify and stock in kanban rack Location: <u>LG</u>								
180									
<b>*180*</b>	QC21- Final Inspection - Work Order Release	0.00							
QC	Memo	0.00							
Quality Control									

12/6/27 ~~12/6/21~~

YMF  
12-06-20



W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

# Picklist Print

June-07-12 9:25:46 AM

Page 1

Work Order ID: 85387

\*85387\*

Parent Item: D412-664-203TRN

\*D412-664-203TRN\*

Parent Item Name: Crosstube Turning Detail

Start Date: 07/06/2012

Required Date: 21/06/2012

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A 08-03-06 new issue DD verified by:eec  
IPP Rev B 08.04.02 Removed polish EC verified by: DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6009-129		Manufactured	No			120	Each	23.0000	1	1			

\*D6009-129\*

Crosstube Material

\*\*

Location

Loc Qty

Loc Code

LG

23

69801

23

mm.l  
16/06/12

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

<b>DART AEROSPACE LTD</b>		<b>Work Order:</b> 85387
<b>Description:</b> Crosstube Assembly (412 High Aft)		<b>Part Number:</b> D412-664-243
<b>Inspection Dwg:</b> D412-664-243 <b>Rev:</b> E		<b>Page 1 of 2</b>

### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Inspection Sheet	Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.684	+0.005/-0.000	2.686	✓		vern	CNC-OK
	2.748	+0.005/-0.000	2.749	✓			
	2.884	+0.005/-0.000	2.886	✓			
	3.019	+0.005/-0.000	3.022	✓			
	3.163	+0.005/-0.000	3.164	✓			
	3.308	+0.005/-0.000	3.312	✓			
	3.429	+0.005/-0.000	3.430	✓			
	2.990	+0.005/-0.000	2.991	✓			
	2.618	+0.005/-0.000	2.621	✓			
	0.200	+/-0.010	.206	✓		vern	CNC-OK
	R0.063	+/-0.010	.063	✓		RG	
	R0.500	+/-0.010	.500	✓		in	
	4.971	+/-0.030	4.971	✓		vern	CNC-OK
SIDE B	2.684	+0.005/-0.000	2.687	✓		vern	CNC-OK
	2.748	+0.005/-0.000	2.752	✓			
	2.884	+0.005/-0.000	2.888	✓			
	3.019	+0.005/-0.000	3.023	✓			
	3.163	+0.005/-0.000	3.164	✓			
	3.308	+0.005/-0.000	3.312	✓			
	3.429	+0.005/-0.000	3.430	✓			
	2.990	+0.005/-0.000	2.991	✓			
	2.618	+0.005/-0.000	2.621	✓			
	0.200	+/-0.010	.200	✓		vern	CNC-OK
	R0.063	+/-0.010	.063	✓		RG	
	R0.500	+/-0.010	.500	✓		in	
	4.971	+/-0.030	4.971	✓		vern	CNC-OK
	124.100	+/-0.020	124.100	✓		tape	LG-25

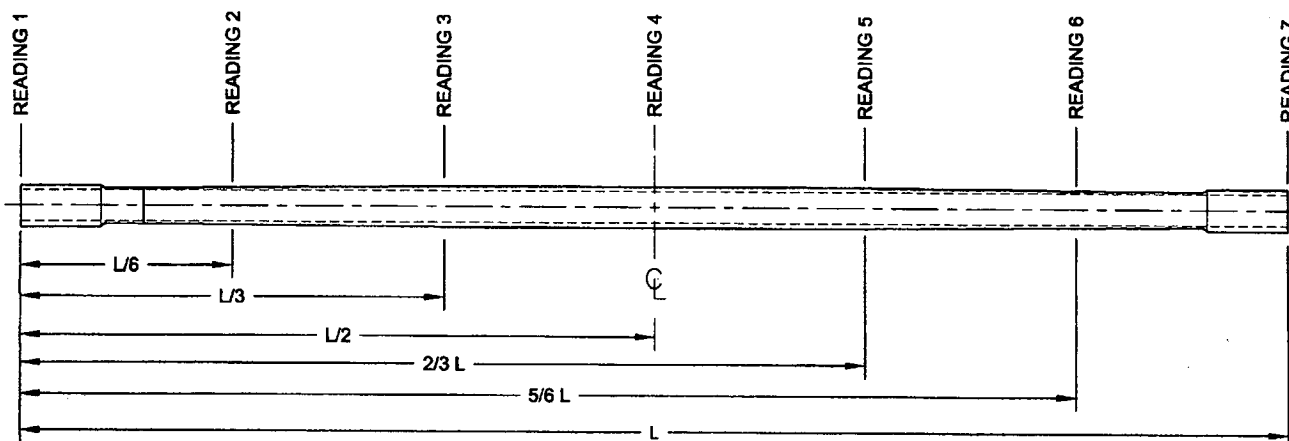
<b>Measured by:</b> mm-l	<b>Audited by:</b> DP	<b>Prototype Approval:</b>	N/A
<b>Date:</b> 12/06/16	<b>Date:</b> 12-6-18	<b>Date:</b>	N/A

Rev	Date	Change	Revised by	Approved
A	04.06.16	New Issue (P/O D412-664-203)	KJ/JLM	
B	06.03.09	Dwg Rev updated	KJ/JLM	
C	07.05.08	Tolerance updated for dimension 4.971	KJ/JLM	
D	10.02.02	Dimension 124.100 was 124.09	KJ	



<b>DART AEROSPACE LTD</b>	<b>Work Order:</b> 85387
<b>Description:</b> Crosstube Assembly (412 High Aft)	<b>Part Number:</b> D412-664-243
<b>Inspection Dwg:</b> D412-664-243 Rev: E	<b>Page 2 of 2</b>

### WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation $\Delta w$ (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	.376	.374	.384	.379	.010	0.073"
READING 2 L=	.315	.320	.315	.312	.008	
READING 3 L=	.497	.482	.469	.486	.015	
READING 4 L=	Can't measure		OK 4/14/27			
READING 5 L=	.488	.488	.470	.477	.018	
READING 6 L=	.328	.313	.303	.322	.025	
READING 7 L=	.379	.371	.387	.381	.016	

#### Calibration Result

Actual Block Thickness: 100-500

Sitiescan 250 Measured Thickness: 100-500

<b>Measured by:</b> KC/gmm.L	<b>Audited by:</b> [Signature]	<b>Preliminary Approval:</b>
<b>Date:</b> 12-6-20	<b>Date:</b> 12-6-20	<b>Date:</b>

Rev	Date	Change	Revised by	Approved
A	04.06.16	New Issue (P/O D412-664-203)	KJ/JLM	
B	06.03.09	Dwg Rev updated	KJ/JLM	
C	07.05.08	Tolerance updated for dimension 4.971	KJ/JLM	
D	10.02.02	Dimension 124.100 was 124.09	KJ	
E	12.06.04	Wall thickness form added	KJ	[Signature]



Item	Qty -243	Part Number	Description
1	X	D412-664-243	CROSSTUBE ASSEMBLY (412 HIGH AFT)
2	1	D6009-129	CROSSTUBE
3	2	D3595-063-570	RUBBER CUSHION
4	1	D2896-1	SUPPORT
5	2	D3189-1	CHAFING SHIELD
6	2	D2856-600-1009	ABRASION STRIP
7	4	MS21920-28	CLAMP
8	2	MS21920-30	CLAMP (OR MS21920-32)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

# **GENERAL NOTES:**

- 1) MATERIAL: MANUFACTURED FROM D6009-129  
FINISHED LENGTH = 124.100±0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D412-664-243" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 47.0 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2896-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE THE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 15) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 85387 MCT

12/06/07

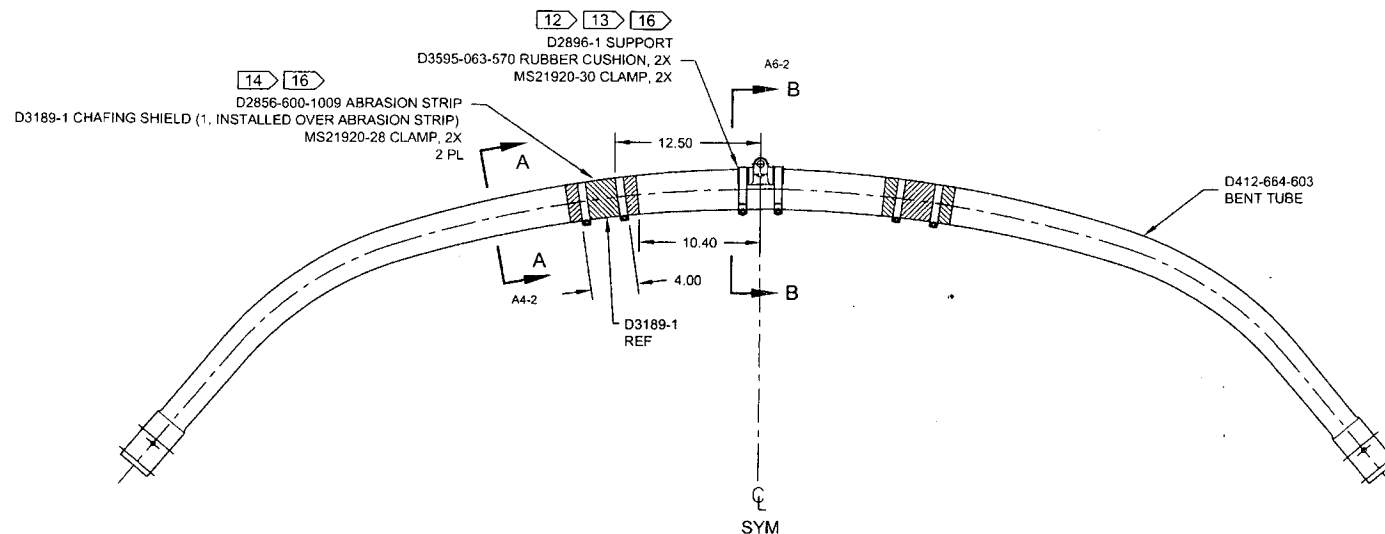
② DEO ATTACHED

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2009-10-29

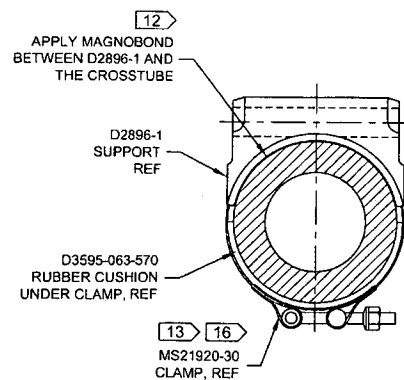
E	REFORMAT/REVISE GENERAL NOTES; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); ADD TOLERANCE (ZN B6-3, C4-3, C6-3 & C5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4.	RF	09.09.30
D	REMOVE D2732-058, CHANGE TO D3595-063-570	PH	07.03.09
C	REMOVE D2856-600-1087, ADD D2732-058 & MAGNOBOND 6398. MS21920-32 WAS MS21920-30	MB	06.10.27
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	01.10.17
REV.	DESCRIPTION	BY	DATE
DESIGN	PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF	DRAWING NO.	REV. E
CHECKED	PH	D412-664-243	SHEET 1 OF 4
MFG. APPR.	PH	TITLE	SCALE
APPROVED	PH	CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
DE APPR.	PH	COPYRIGHT © 2001 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	
DATE	09.09.30		



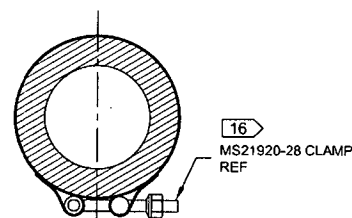




**D212-664-243**  
**ASSEMBLY DETAIL**



**SECTION B-B** D4-2  
SCALE 4X



**SECTION A-A** C6-2  
SCALE 4X

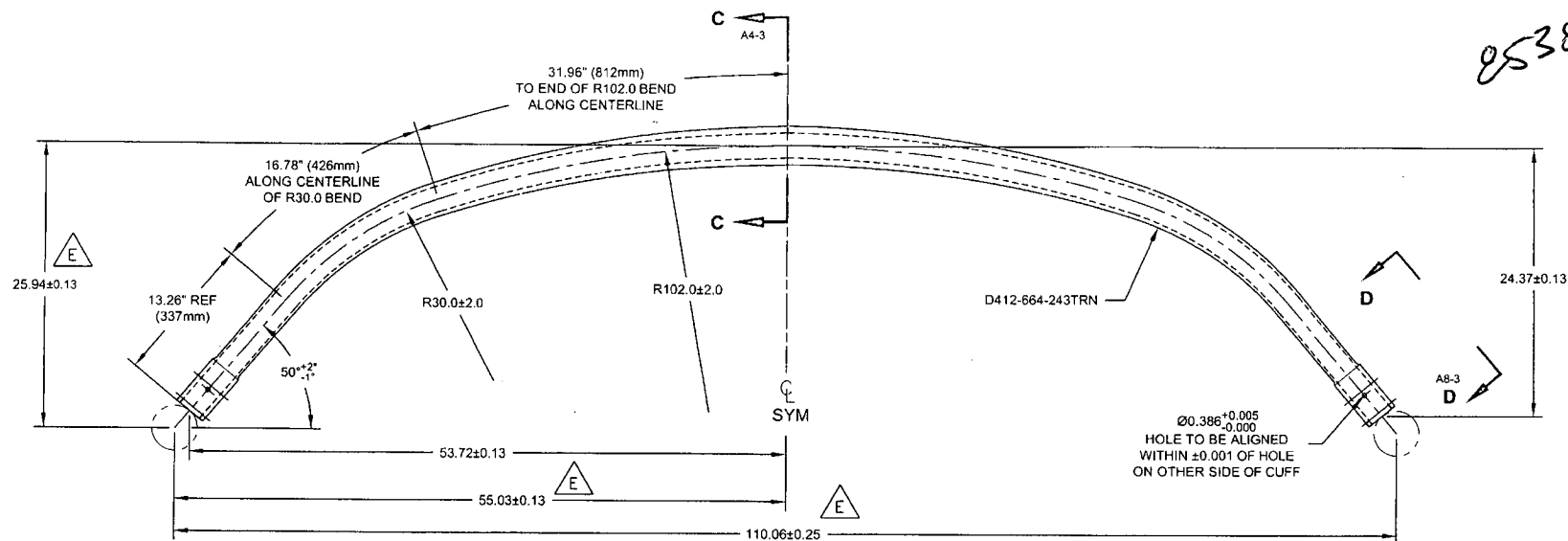
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2009-10-28

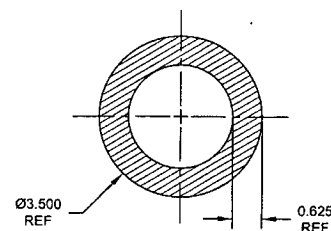
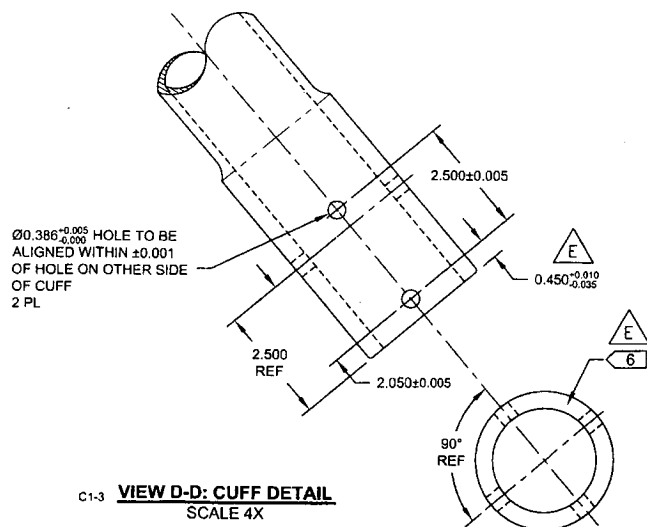
DESIGN		<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. E
MFG. APPR.		D412-664-243	SHEET 2 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
DATE	09.09.30	<small>COPYRIGHT © 2001 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	



05387



**D412-664-603** 10  
**BENDING AND DRILLING DETAIL** E

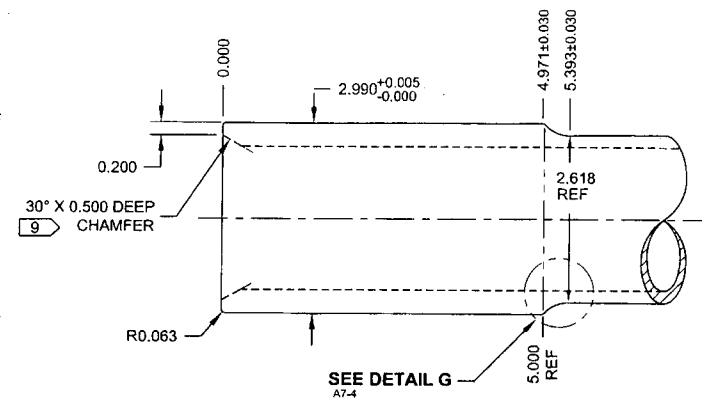
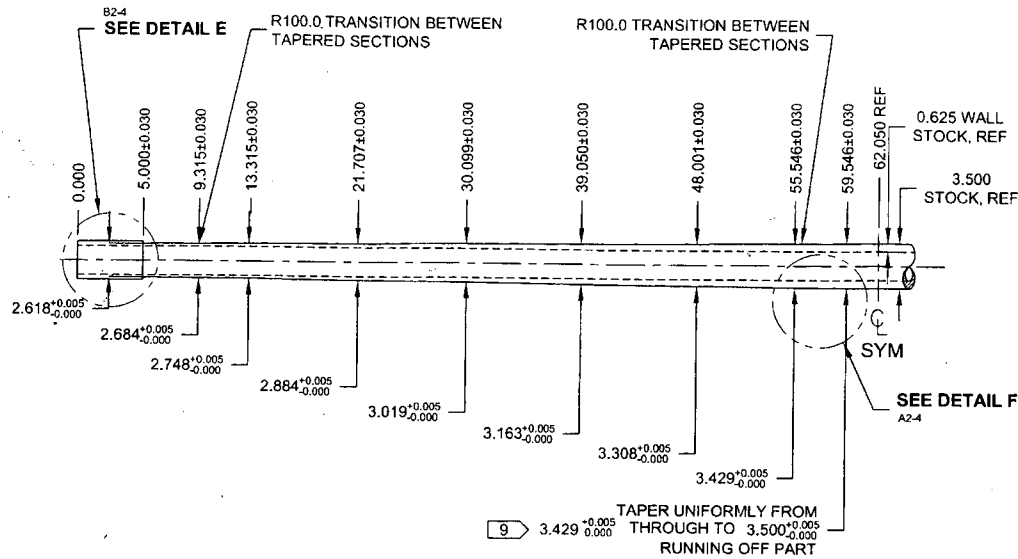


② DEO ATTACHED

**RELEASED**  
 2009-10-29  
 MP

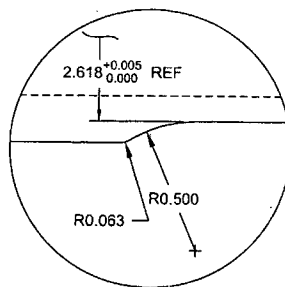
DESIGN	PH	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	Q	DRAWING NO.	REV. E
MFG. APPR.	SS	D412-664-243	SHEET 3 OF 4
APPROVED	AP	TITLE	SCALE
DE APPR.	H	CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
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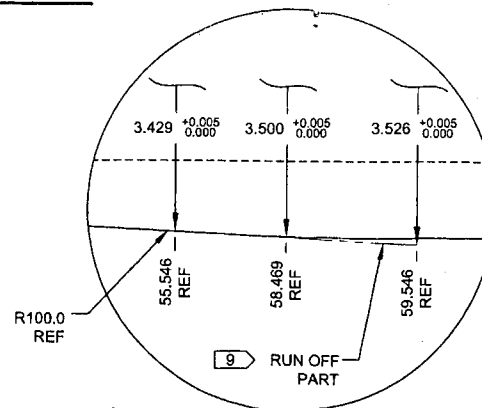


DETAIL E:  
CROSSTUBE CUFF DB-4  
SCALE 5X

D412-664-243TRN  
TURNING DETAIL



DETAIL G:  
CUFF TRANSITION C2-4  
SCALE 10X



DETAIL F:  
TAPER RUN-OFF C4-4  
NOT TO SCALE

DEO ATTACHED

RELEASED  
2009-10-29

DESIGN	PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	Q	DRAWING NO.	REV. E
MFG. APPR.	18	D412-664-243	SHEET 4 OF 4
APPROVED	10	TITLE	SCALE
DE APPR.	11	CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
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DRAWING NO. D412-664-243	TITLE CROSSTUBE ASSEMBLY (412 HI AFT)	REV. E	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D412-664-243-E-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN	CHECKED	MFG. APPR.	APPROVED		DE APPR.		
DATE 11.03.31	DATE 11/03/31	DATE 11.03.31	DATE 11/03/31		DATE 11-03-31		

**PURPOSE:**

REMOVED ABRASION STRIP IN FAVOR OF A THIN LAYER OF PROSEAL 890.

05387

**CHANGE:**

PARTS LIST IS AMENDED AS FOLLOWS:

**IS:**

Item	Qty -243	Part Number	Description
6	0	D2856-600-1009	ABRASION STRIP

**WAS:**

6	2	D2856-600-1009	ABRASION STRIP
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NOTES 2 AND 14, SHEET 1 ARE AMENDED AS FOLLOWS:

**IS:**

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA)  
PAINT OUTSIDE PER DART QSI 005 4.2  
AFTER PAINTING, APPLY CLEAR COAT ON HATCHED AREA
- 14) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3189-1  
CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL  
PROSEALED D3189-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF  
PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.

**WAS:**

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF  
CROSSTUBE PER QSI 035.

RELEASED  
2011-04-07  
MP









DRAWING NO. D412-664-243	TITLE CROSSTUBE ASS'Y (412 HI AFT)	REV. E	<b>DART AEROSPACE LTD ENGINEERING ORDER</b>		D.E.O. NO. D412-664-243-E-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>47</i>	CHECKED <i>ASS</i>	MFG. APPR. <i>RE</i>	APPROVED <i>MP</i>		DE APPR. <i>#</i>		
DATE 11.09.07	DATE 11.09.19	DATE 11.09.19	DATE 11.09.19		DATE 11.09.19		

*05307*

**PURPOSE:**

REPLACE MAGNOBOND WITH 3M DP460 SCOTCH-WELD EPOXY ADHESIVE

**CHANGE:**

IS:

Item	Qty -243	Part Number	Description
9	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD

WAS:

9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
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NOTE 12 & 16, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) INSTALL D2896-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. **PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURED FOR 24 HOURS.**

WAS:

- 12) INSTALL D2896-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

**RELEASED**  
2011-09-29  
*MP*



# EXTRUSION INSPECTION SHEET

## ULTRA SONIC MEASUREMENTS

TUBE #	TOTAL LENGTH	DIA two readings	INSIDE DIA	wall thickness measured w/vern	Straghtness at 12"	Rockwell Reading	LOCATION on tube	R1	R2	R3	R4
1	129.00"	3.495"/3.492"	2.249"	0.612"/0.625"	0.019"	N/A	middle 64.5"	0.631"	0.631"	0.624"	0.624"
2	129.00"	3.500"/3.495"	2.249"	0.612"/0.641"	0.010"	N/A	middle 64.5"	0.630"	0.621"	0.625"	0.632"
3	129.00"	3.490"/3.498"	2.249"	0.615"/0.635"	0.005"	N/A	middle 64.5"	0.633"	0.638"	0.624"	0.618"
4	129.00"	3.491"/3.496"	2.248"	0.623"/0.632"	N/A	N/A	middle 64.5"	0.638"	0.630"	0.616"	0.625"
5	129.00"	3.498"/3.504"	2.250"	0.615"/0.621"	N/A	N/A	middle 64.5"	0.631"	0.624"	0.624"	0.630"
6	129.00"	3.493"/3.494"	2.249"	0.628"/0.612"	N/A	N/A	middle 64.5"	0.621"	0.623"	0.630"	0.623"
7	129.30"	3.491"/3.493"	2.250"	0.616"/0.630"	N/A	N/A	middle 64.5"	0.625"	0.629"	0.627"	0.627"
8	129.00"	3.495"/3.495"	2.249"	0.625"/0.615"	N/A	N/A	middle 64.5"	0.624"	0.623"	0.627"	0.627"
9	129.00"	3.499"/3.498"	2.250"	0.633"/0.613"	0.008"	N/A	middle 64.5"	0.631"	0.641"	0.621"	0.620"
10	129.00"	3.495"/3.501"	2.251"	0.624"/0.618"	N/A	N/A	middle 64.5"	0.619"	0.626"	0.636"	0.637"
11	129.00"	3.497"/3.500"	2.250"	0.625"/0.625"	N/A	N/A	middle 64.5"	0.621"	0.624"	0.632"	0.640"
12	129.00"	3.494"/3.498"	2.252"	0.615"/0.631"	N/A	N/A	middle 64.5"	0.625"	0.629"	0.629"	0.629"
13	129.00"	3.493"/3.495"	2.251"	0.621"/0.615"	N/A	N/A	middle 64.5"	0.631"	0.626"	0.623"	0.628"
14	129.00"	3.491"/3.494"	2.250"	0.620"/0.618"	N/A	N/A	middle 64.5"	0.627"	0.621"	0.626"	0.642"
15	129.00"	3.493"/3.501"	2.246"	0.625"/0.628"	N/A	N/A	middle 64.5"	0.627"	0.630"	0.631"	0.626"
PART # D6009-129		P/O# 14138		BATCH # B69801		Notes:					

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